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## (54) FLAT TIRE REPAIRING AGENT

### (57)Abstract:

PROBLEM TO BE SOLVED: To provide a flat tire repairing agent showing reliable can-stability and excellent flat tire repairing performance by adding vinylon short fibers to a blend of natural rubber latex and synthetic rubber latex.

SOLUTION: The flat tire repairing agent is composed of a natural rubber latex and a synthetic rubber latex with vinylon short fibers added. The synthetic rubber in the synthetic rubber latex is, for example, a styrene-butadiene copolymer rubber(SBR), an isobutylene rubber(IR) or the like, and the blending ratio (solid content weight) of the natural rubber latex to the synthetic rubber latex in the blend is preferably 80/20-20/80. The vinylon short fibers are preferably of such characteristics that the diameter is 50-100  $\mu\text{m}$ ; the length is 1-5 mm; the complete water-soluble temperature is 70°C or more and the content ratio of the vinylon short fibers is 1-15 pts.wt. to 100 pts.wt. aqueous solution containing 40 wt.% or more (solid content) blend. The aqueous solution contains 40-70 wt.% (solid content) blend.

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**CLAIMS**

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**[Claim(s)]**

[Claim 1]A tire blowout repair agent which blends the vinylon staple fiber with mixed material of natural rubber latex/synthetic rubber latex.

[Claim 2]The tire blowout repair agent according to claim 1 whose rates of a compounding ratio of the natural rubber latex/synthetic rubber latex of said mixed material (solid content weight) are 80 / 20 - 20/80.

[Claim 3]The tire blowout repair agent according to claim 1 or 2 whose path of said vinylon staple fiber is 50-1000 micrometers, whose length is 1-5 mm and whose perfect aqueous temperature is not less than 70 \*\*.

[Claim 4]The tire blowout repair agent according to claim 1, 2, or 3 which carries out 1-15 weight-section combination of said vinylon staple fiber to solution 100 weight section which is included as for said 40 % of the weight (solid content) of more than mixed material.

[Claim 5]The tire blowout repair agent according to claim 4 to which said solution contains said mixed material 40 % of the weight (solid content) - 70% of the weight (solid content).

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]**

[0001]

[Field of the Invention]This invention relates to the tire blowout repair agent used for fixing and plugging up the blowout hole, when a tire blows out.

[0002]

[Description of the Prior Art]Conventionally, as a tire blowout repair agent, what used rubber latex, especially NR latex (natural rubber latex) as the main ingredients is proposed, for example. However, the thing which consists of NR latex, Storage stability (stock stability) is bad and disadvantageous for a prolonged stock, for example, when the life at the time of being neglected in the suitcase of a car will pass over it in about one year, it solidifies or gels and it becomes impossible to pour into the tire by which mobility fell remarkably and blew out.

[0003]Then, in order to improve storage stability, blending latex of synthetic rubbers, such as styrene butadiene copolymer rubber (SBR), with NR latex is made, but. If latex of a synthetic rubber is blended, the blowout repair performance of the blowout repair agent obtained itself will fall, for example, it will become impossible thus, to fix the blowout hole by a thick nail not less than 4 mm in diameter.

[0004]

[Problem(s) to be Solved by the Invention]The purpose of this invention is to provide the tire blowout repair agent excellent in both storage stability and the blowout repair performance.

[0005]

[Means for Solving the Problem]A tire blowout repair agent of this invention blends the vinylon staple fiber with mixed material of natural rubber latex/synthetic rubber latex.

[0006]Thus, since synthetic rubber latex was used to natural rubber latex, storage stability can be improved, Since it was made to compensate by blending the vinylon staple fiber for a fall of blowout repair performance by having used synthetic rubber latex, and plugging up a blowout

hole with the vinylon staple fiber, it becomes possible to also improve blowout repair performance.

[0007]

[Embodiment of the Invention]The mixed material used by this invention consists of natural rubber latex and synthetic rubber latex. The synthetic rubber in synthetic rubber latex, for example Styrene butadiene copolymer rubber (SBR), They are a polyisoprene rubber (IR) butadiene rubber (BR) vinylpyridine styrene butadiene terpolymer, chloroprene rubber (CR), acrylonitrile butadiene copolymer rubber (NBR), etc. As synthetic rubber latex, mixtures, such as CR latex, NBR latex, or these, vinylpyridine styrene butadiene terpolymer latex, can also be used. It is possible to perform selection of rubber latex suitably according to use.

[0008]The rate of a compounding ratio of the natural rubber latex/synthetic rubber latex in the above-mentioned mixed material (solid content weight) is good in it being 80 / 20 - 20/80. The storage stability of the blowout repair agent from which the rate of a compounding ratio of natural rubber latex (solid content weight) is obtained by having too little synthetic rubber latex by 80 \*\* will fall. The blowout repair performance of a tire blowout repair agent in which the rate of a compounding ratio of natural rubber latex (solid content weight) is obtained by having too little natural rubber latex by less than 20 on the other hand will fall. It is good to use it for this mixed material in solution, carrying out [ 40% of the weight or more, that concentration's adding water so that it may become 40 % of the weight - 70% of the weight preferably, and ] (that is, this solution). Said mixed material is contained preferably more than 40 % of the weight (solid content) 40 % of the weight (solid content) - 70% of the weight (solid content).

[0009]The tire blowout repair agent of this invention blends the vinylon staple fiber with the above-mentioned mixed material. As opposed to solution 100 weight section (.) as for which 40 % of the weight (solid content) of more than the above-mentioned mixed material includes combination of the vinylon staple fiber That is, the concentration of mixed material is good to perform the vinylon staple fiber by carrying out 2-10 weight-section combination preferably one to 15 weight section to 40% of the weight or more of solution 100 weight section. When there are few loadings of the vinylon staple fiber than one weight section, blowout repair performance will fall, and the mobility of the tire blowout repair agent which will be obtained on the other hand if more than 15 weight sections will fall.

[0010]The above-mentioned vinylon staple fiber is 50-1000 micrometers in path, length is 1-5 mm, and perfect aqueous temperature has not less than 70 \*\* of not less than 90 \*\* preferably good things. Since the vinylon staple fiber dissolves immediately in a tire blowout repair agent in less than 50 micrometers, it becomes impossible for a path to plug up a blowout hole with the vinylon staple fiber (fall of blowout repair performance), On the other hand, at more than 1000 micrometers, the mobility of a tire blowout repair agent is insufficient for a path, and it becomes difficult [ it / to inject the repair agent into a blowout hole ]. Blowout repair

performance falls [ length ] in a similar manner by at least less than 1 mm, and it becomes difficult for length to inject a repair agent into a blowout hole in a similar manner more than 5 mm. It is because the vinylon staple fiber dissolves in a repair agent before use of the repair agent when perfect aqueous temperature neglects the tire blowout repair agent obtained in the suitcase of a passenger car in less than 70 \*\*, for example, so the blowout repair performance of a tire blowout repair agent falls.

[0011]In the above-mentioned blowout repair agent, the medicine for improving the mobility at the time of low temperature, for example, ethylene glycol, and the resin which promotes solidification, for example, resorcinol formalin resin, may be added suitably.

[0012]

[Example]The tire blowout repair agent was produced by adding optimum dose of water into the mixture which carried out 10 weight-section (solid content) combination of 40 weight sections (solid content) and the butadiene rubber latex (40 % of the weight of solid content) for natural rubber latex (40 % of the weight of solid content), and making the whole it at 100 weight sections (conventional example 1).

[0013]To these tire blowout repair agent 100 weight sections, ten weight sections of vinylon staple fibers (a path is 900 micrometers and the perfect aqueous temperature of length is 95 \*\* at 4 mm) were blended, and another tire blowout repair agent was produced (example 1).

[0014]100 weight sections of natural rubber latex (60 % of the weight of solid content) were used as a tire blowout repair agent (comparative example 1).

[0015]100 weight sections of styrene butadiene copolymer rubber latex (60 % of the weight of solid content) were used as a tire blowout repair agent (comparative example 2).

[0016]These tire blowout repair agents were injected into the blowout hole made in the tread part of the radial-ply tire containing air of tire sizes 195 / 60 R14, respectively with a nail 2 mm in diameter, and a nail 5 mm in diameter, and the blowout hole was fixed. The tire fixed [ these ] was allowed to stand at the room temperature (20 \*\*) for 24 hours in the formal pressure and normal load to which it is specified at JATMA in 1999.

[0017]if the tire inner pressure at the time of 24-hour progress is measured and an initial pressure (formal pressure) has the 3/4 or more internal pressure -- blowout repair -- with [ it is effective and / "O" and less than 3/4 ] no blowout repair effect -- it judged with "x." This result is shown in Table 1.

[0018]These tire blowout repair agents were neglected for one year in the suitcase of a car. As a result, the case where storage-stability-less "x" tire blowout repair agent held mobility for the case where a tire blowout repair agent solidified or gels was made into those with storage stability "O." This result is also shown in Table 1.

[0019]

[Table 1]

表\_1

	実施例1	従来例1	比較例1	比較例2
パンク修理効果	○	×	○	×
貯蔵安定性	○	×	×	○

[0020]In Table 1, the conventional example 1 is a case where the tire inner pressure at the time of 24-hour progress is 53% of an initial pressure, Example 1 is 82% of case, the comparative example 1 is 80% of case, and the comparative example 2 is 10% of case. In the case of this invention (example 1), it compares with the conventional example 1 and the comparative examples 1 and 2, and it turns out that it excels in both storage stability and the blowout repair performance so that clearly from these results.

[0021]

[Effect of the Invention]As explained above, the tire blowout repair agent of this invention blends the vinylon staple fiber with the mixed material of natural rubber latex/synthetic rubber latex, and sake, it becomes possible to excel in both storage stability and blowout repair performance.

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[Translation done.]